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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:

Esch, *et al*

Appl. No.: 08/870,591

Filed: June 6, 1997

For: **Precipitated Silicas**

Art Unit: 1754

Examiner: S. Hendrickson

Atty. Dkt. 21123/238397

Declaration Under 37 C.F.R. § 1.132

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

The undersigned, Dr. Udo Görl, declares as follows:

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Background Statements

1. I am Director of Research & Technical Marketing, Rubber/Filler Composite Systems at Degussa AG. I am also an inventor named on U.S. application 08/870,591.
2. I have read and understand the above-captioned application. It is my understanding that a response to an Office Action is being filed and that the claims in the Appendix attached hereto will be pending in the application upon the entry of the amendments in the response. I have read and understand these claims.
3. I have reviewed the Office Actions which were mailed in connection with the above-captioned application on June 8, 1998, December 30, 1998, February 7, 2001, and on February 25, 2002. I have also studied the references cited in these Office Actions, in particular the references by Lagarde, *et al.* (U.S. 4,704,425) and by Johnson, *et al.* (U.S. 4,681,750).

Allegations by Examiner

4. It is my understanding that the Examiner has alleged that the reference by Lagarde discloses a silica having a BET of 242, a CTAB of 237, and a BET/CTAB ratio of

1.02. The other properties of the silica claimed by Applicants are alleged to be inherent in those disclosed. The Examiner also suggests that the Lagarde reference provides a motivation to make silicas having the characteristics recited in Applicants' claims. Finally, the Examiner acknowledges that Lagarde does not disclose silica having an aggregate particle size as small as that recited in Applicants' claims, but alleges that the disclosure of a size of less than 45 microns subsumes the sizes claimed.

5. With respect to Johnson, the Examiner alleges that the reference discloses silica made by a process that is essentially the same as the process used by Applicants and contends that, since the manufacturing processes are the same, the silicas that are made must be the same as well.
6. During prosecution, the Examiner has chosen not to give consideration to two Declarations Under 37 CFR §1.132 submitted by Applicants on November 2, 1998. I am the Declarant on both of these Declarations. The first is dated September 4, 1997 and discusses experiments designed to compare the silica of Lagarde with that of Applicants. The second is dated October 15, 1998 and compares silica made by the process of Johnson with that of Applicants. The Examiner disregarded these references based upon the argument that they compare the vulcanized products made using the silicas rather than the silicas themselves.

Response to Examiner's Allegations

7. It is my opinion as an expert in the field of rubber technology that the Examiner's disregard of the test results presented in the Declarations discussed above, *i.e.*, the Declaration dated September 4, 1997 and the Declaration dated October 15, 1998, is unwarranted. The tests conducted are appropriate because they reflect the way in which the silicas behave in a product of intended use. Moreover, since all of the other relevant components used in making the compared compositions, except for the silicas, were essentially the same, it is reasonable to conclude that the differences discussed in the Declarations are a direct result of differences in the silicas themselves.

8. The silicas of the present invention produced a product with characteristics superior to those made using the silica of either Lagarde or Johnson. Based on the results obtained, one of skill in the art would conclude that the Examiner's allegation that the silicas described in the cited references must be inherently the same as those claimed is incorrect. Moreover, given the difference with respect to the intended use of the silica claimed compared to the intended use of the silicas of Lagarde or Johnson, one of skill in the art would have no motivation to modify the silicas presented in those references to more closely correspond to those claimed by Applicants.
9. The Examiner has rejected claims based upon the allegation that Lagarde discloses a silica with a BET of 242, a CTAB of 237 and a BET/CTAB ratio of 1.02 and that the other parameters required of the silicas claimed by Applicants are inherent, *i.e.*, given the disclosed characteristics, all of the others set forth in Applicants' claims must necessarily follow. This is incorrect. It is entirely possible to produce silicas having the BET and CTAB values disclosed in Lagarde and which have a pore volume, average aggregate size, DBP value or a V_2/V_1 value that falls substantially outside of the ranges provided in Applicants' claims. Thus, the Examiner's allegation that Lagarde inherently discloses the presently claimed silicas is without foundation.
10. The Examiner seems to recognize that the reference by Johnson does not expressly disclose a silica having the properties set forth in the present claims. However, the Examiner appears to conclude that the silicas must be the same because they are made by a process that is essentially the same as that used by Applicants. This is incorrect. The process disclosed by Johnson differs from that of Applicants in the following ways:
 - a) Johnson describes methods of preparing silicas in which two different precipitation methods are used. In one, a constant precipitation is carried out at a pH of 12.8 – 12.9 (2.1 – 2.6 g/l Na_2O). In the other, the precipitation is carried out at a pH of 13.2 – 13.4 (5.6 – 7.2 g/l Na_2O). In contrast, Applicants precipitate in the pH range of 7.5 – 10.5.

- b) The Johnson reference describes a multistage precipitation method involving: precipitation, a first reacidification, aging and a second reacidification. In contrast, Applicants have a one stage method involving precipitation and reacidification (no aging).
- c) The highest solid concentration used by Johnson was 21.7 g/l (see Example 1). In contrast, Applicants have 90-120 g/l SiO₂O.

Other properties of compositions such as Sears number, V2/V1 result directly from the above procedure. Thus, the allegation that Johnson must disclose compositions that are essentially the same as those claimed by Applicants is entirely unjustified.

- 11. Claim 16 of the application requires an aggregate size of less than 1.5 microns (see page 2 of the Office Action for a discussion). In contrast, Lagarde discloses a particle size of less than 45 microns. The Examiner alleges that this teaching subsumes Applicants' silicas. However, a teaching of an upper limit on particle size does not mean that any particle smaller than the upper limit can be made. There is nothing in the teachings of Lagarde to suggest that the procedures described therein would result in silica particles having a size falling within the range required by the present claims. Thus, the reference not only fails to describe particles with the required sizes but also fails to teach a method which would produce such particles.

Summary and Conclusion

- 12. In light of the above considerations, it is my conclusion that the references cited by the Examiner do not disclose silicas that are substantially the same as those presently claimed. It is further my conclusion that there are no teachings in the references that would provide a motivation to modify the silicas disclosed therein so that they would assume the parameters presently set forth in Applicants' claims.

13. I further declare that all statements made herein on the basis of personal knowledge are true, and all statements made on information and belief are believed to be true; and further that any willful false statements or the like so made are punishable by fine or imprisonment or both under Section 1011 of Title XVIII of the United States Code; and that such willful false statements may jeopardize the validity of the above-captioned application and any patent issuing thereon.

Respectfully submitted,

05/05/2002

Date


Name of Declarant

Appendix

16. A precipitated silica having the following physico-chemical properties:
- | | |
|---|------------------------------|
| BET surface area: | 35 to 350 m ² /g; |
| BET/CTAB surface area ratio: | 0.8 to 1.1; |
| pore volume, PV: | 1.6 to 3.4 ml/g; |
| silanol group density, ml of NaOH
consumed in raising pH to 9: | 6 to 20 ml; |
| average aggregate size: | 250 to 1500 nm; |
| CTAB surface area: | 30 to 350 m ² /g; |
| DBP volume: | 150 to 300 ml/100 g; |
| V ₂ /V ₁ by Hg porosimetry: | 0.19 to 0.46; and |
| DBP/CTAB: | 1.2 to 3.5. |
17. The precipitated silica of claim 16, wherein the DBP/CTAB ratio is 1.2 to 2.4.
20. The precipitated silica of claim 16, wherein said DBP/CTAB ratio is 1.545 – 3.5.